REPORT of Nov. 28th MEETING of the FFCC

A meeting of the Fusion Facilities Coordinating Committee was held by televideo on November 28. The FFCC participants in the meeting were Rich Hawryluk, Ian Hutchinson, Martin Peng, Ron Stambaugh, S. Prager, S. Milora and K. Young representing N. Sauthoff. In addition, Don Priester, Rostom Dagazian, John Willis, Warren Marton, Erol Oktay, Tony Taylor, Earl Marmar, Masa Ono, and Mike Williams participated in the meeting.

The first topic on the agenda was a draft document entitled "Office of Fusion Energy Sciences Peer Review Policy and Guidelines for Major Operating Fusion Facilities." Warren Marton distributed this for comment prior to the meeting. The large facilities will be reviewed every 5-years as part of the contract renewal. (Though the contract renewal process differs for PPPL, NSTX will undergo a similar review process.) In addition, there will be a mid-point assessment, which will be less comprehensive and require less preparation than the major 5-year renewal. Also, the facilities will submit a Field Work Proposal annually. University grants will be reviewed every 3 years and submit an annual continuation report. The workscope performed by the National Laboratories will also be reviewed. The draft document needs to clarify how this workscope will be reviewed. In particular, will it be reviewed as part of the 5-year facility review, as suggested at the meeting? Alternatively, will it be reviewed as part of bullet two or will it be reviewed as part of an institutional review (bullet four)? One suggestion was that the workscope be reviewed as part of the five-year facility review and the mid-point assessment is conducted as an institutional review. Since not all of the facility reviews will occur during the same year, this introduces some complications. The same workscope should not undergo several independent unrelated reviews. Another topic was whether the grants should be reviewed simultaneously or not. DIII-D preferred to have all of the grants reviewed together, since there are relatively few grants. NSTX preferred to stagger the grant review, since a fraction of the collaborators are supported by grants. DOE prefers to have solicitations for collaborations every 2 or 3 years. The concern is that there may not be sufficient funds to warrant an annual solicitation. The Research Forum/Brainstorming meetings provide a forum to explore new ideas with the community and it is possible to submit a proposal off cycle. In general, the solicitations provide a well-defined mechanism for attracting new players to work on the facilities; however, by linking them to increasing budgets this may discourage participation by new players.

John Willis led a discussion of the need to make the facilities available and attractive to scientists outside of fusion who require the unique combination of physical parameters and diagnostics to study "deep scientific questions. The need to identify potential users and determine their interests has not been successfully done. Ron Stambaugh has volunteered to organize a subgroup to scope out how this can be done leading perhaps to a national workshop this summer. Since this issue is common to all three facilities, this was an area were joint effort would be appropriate. **Action: Peng and Hutchinson to identify people to work with Ron.** How this work should be funded is an open issue. Whether there is sufficient interest to warrant a solicitation needs to be determined. Ron Stambaugh related a discussion at the DIII-D DAC three years ago, which was negative about making run time available for such studies. The NRC Report strongly encourages work in this area and all three facilities are encouraged to support it.

Mike Williams gave an update on the activities of the Fusion Facilities Operating Committee. Good progress was made at the first meeting. A couple of noteworthy items were mentioned including distributing information on arc blast hazards, a web based trouble reporting system at DIII-D and the generation of a list of subject matter experts. Warren Marton identified that further work is needed to define run time. At this meeting, we proposed defining a run week as 40 hours of scheduled physics studies. However, a subsequent discussion revealed that this is not consistent with the way the facilities have defined run weeks previously. **Action: Williams**

At our May meeting, comments were provided on a draft set of Publication Principles. A new draft was distributed prior to the meeting and further comments were provided at this meeting. The resulting document is attached.

Each group gave a brief status report. Only the highlights are provided here.

Ron Stambaugh reviewed the impact of the declining budget on DIII-D operations. One budget issue is the large increase in energy costs ($1M) in San Diego. This further complicates run planning due to the large number of power interruptions during the summer. This year DIII-D will operate 17 weeks. To accommodate the reduced budget and increased costs of energy, procurements have been cut back and the staff assigned to DIII-D by GA reduced from 139 to 128. In addition, there are cuts in staff by the large collaborators working on DIII-D. This was felt to be too large a cut in GA staff and further analysis of the budget is being performed. The DIII-D Executive Committee has endorsed going ahead with the design of the 18 coil for suppression of resistive wall modes. The third year of the ECH Upgrade is being completed this year as well as the construction of a new ECH launcher by PPPL.

The upcoming run will begin on January 15 and continue into June. The torus will be vented in July and operations will resume in November. This is a change in run planning to accommodate the power interruptions during the summer. The DAC will meet January 10-12.

Martin Peng presented new NSTX results since the APS meeting. These will not be summarized here but were distributed electronically. NSTX is presently operating and is scheduled to complete the run in December. Maintenance will begin in January and operations resume in May. The plan is to run 15 weeks this year, approximately half during the present run and the remainder next spring and summer. The machine will be down in August to accommodate vacations and operations in September will be determined by availability of funds. NSTX will have a Research Forum January 15-18 and conduct a PAC meeting February 8-9.

Ian Hutchinson discussed the status and plans of C-Mod. The impact of the budget cut has been to reduce operations for FY'01 from 17 weeks to 13-14 weeks. The schedule of the lower hybrid launcher will be stretched out into FY'03. (John Willis stated that we need to include contingency in planning upgrade projects even if funded by operating funds. This has not been the uniform practice in the past, except for major construction projects.) The inspection of the alternator in FY'03 will cost $750k and is not in the present budget. The impact of the budget cuts has been to reduce the research, engineering and technical support staffs by one each. A recent decision has been made to extend the run till March, since the parts for the divertor upgrade are awaiting delivery. A short vent may be necessary for the Bay J antenna, but a decision has not been made. The PAC meeting will be February 5-6.

For reference, the DOE Budget Planning meeting will be March 13-15. As a result of the transition between administrations, DOE will provide informal guidance prior to this meeting and provide revised guidance based upon discussions with the new administration. In particular, we will start our planning under the assumption of flat budget guidance and show the impact of the request for incremental funding. John Willis requested that we provide impact statements of the current budget relative to last year. **Action: Hutchinson, Peng and Stambaugh.**

We moved on to a discussion of the relationship of plain English goals, milestones, PEAs and IPPA Level 3 input. Prior to this meeting, Rich Hawryluk distributed some ideas on this topic. A copy of the note is attached. The note describes a hierarchy of how the plain English goals, relate to the milestones, and the PEAs. Ian Hutchinson felt that it was not a good approach to tie these together, since they have different audiences and objectives and in particular, we should not confuse descriptions of the program with managing the program. To avoid, conflicts between strongly related activities in our documents, Rich, Ron and John felt that a hierarchy was a good approach, though John indicated that could also be achieved by use of Level 1 and 2 milestones. PPPL will attempt to use this approach in formulating the PEAs during the next few months. We are awaiting further guidance from OFES as to whether the templates in the Level 3 IPPA document will be used in the FWP submission and whether they will be used in lieu of the standard submission. **Action: OFES**

OFES is collecting data on what is required to fully utilize the three large facilities. In particular, we have been asked to provide information on the incremental costs to operate 26 weeks per year one shift and two shifts. The cost data will identify operating costs, research costs and upgrade costs. DIII-D has identified that it may be more cost effective for them to operate 18 weeks with 1.5 shifts and will provide data for that option. C-Mod and NSTX have been asked to evaluate other alternative options as well. In the past DIII-D has provided an "S-curve" of funding requirements vs. run weeks. All three groups have been asked to provide their current assessment of such costs. Recent discussions have indicated that with perhaps the exception of DIII-D good data on the backlog of experiments on the facilities does not exist. This data would be valuable to justify the request for additional run time. The anecdotal data is compelling that such a large backlog exists. DIII-D identifies the number of requests for experimental run time, those planned and those on the B-list if time permits. They do not have a formal mechanism for generating an approved list of experiments as is done in high energy and nuclear physics. The size of the B-list is also constrained by run time, but provides some assessment of the next round of high priority experiments. Warren Marton indicated that while we should not develop new systems to generate such data, every group should think about how they can provide the Office with such data in the future. **Action: Hutchinson, Peng, and Stambaugh.**

At this meeting, Stan Milora joined the FFCC as a representative of the VLT. One of his roles is to improve the communication between the FFCC and the VLT. He urged the large facilities to include members of the technology community on their PACs. This is currently the case for both NSTX and DIII-D. Stan prior to the meeting distributed a worksheet showing how the VLT is addressing the requests from the three large facilities. This was well received. It was suggested that the heads of the large facilities review the list and provide Stan comments including revised need dates and that Stan provides estimates of when it will be done. (. **Action: Hutchinson, Milora, Peng and Stambaugh**) Two key elements urged from the discussion. First, that the VLT should address long term strategic needs of the facilities. We are seeking to develop partnerships and not a vendor relationship. Second, the VLT has developed core competency in a number of areas of value to the large facilities and being able to access the knowledge and expertise of this group will be beneficial. Stan was asked to include in the VLT plans the work for international collaborations.

Publication Principles for Major Facilities of the U.S. Fusion Community (C-Mod, DIII-D, NSTX)

- The first author, along with the co-authors, bears the responsibility for the technical and scientific accuracy of the publication.

- The first author shall assure that credit is given to each co-author, institution/project that has provided data, machine time, or other services in the publication.

- The first author, along with the co-authors, shall obtain an appropriate review of the publication, prior to publication, from each institution/project, which has supplied data or information.

- Each project shall have a documented procedure for reviews of publications and shall initiate a prompt review of the document (prompt is defined as two weeks or less for the review and providing comments). The project procedure will describe both the process for the review of the paper including the appropriate publication and patent clearances, as well as the process for delegating the review of the paper and obtaining publication and patent clearances to the first author's home institution when that is appropriate.

- The first author and co-authors are responsible for resolving each comment to their satisfaction prior to publishing the document.

- The host institution for the facility on which the work was performed is responsible for placing the document on the worldwide web, submitting it to the Office of Scientific and Technical Information and allowing other institutions/projects to have or link to that publication from their web site. Note: if the research has been conducted on more than one machine (e.g., data taken on C-Mod, DIII-D, and NSTX) the home institution of the first author will patent clear and publish the paper.

- Papers which are not focused on research conducted on the major facilities are the responsibility of the home institution of the first author (such as theory, work for others, and small experimental machines)

Example 1: Professor "X" from Columbia University conducts research on the NSTX facility at PPPL. He documents his research in a publication noting that the work was conducted on the NSTX device. The NSTX Project reviews the document and provides any comments within two weeks. Professor X modifies the publication based on the applicable comments and PPPL issues the publication using their procedures (in this case it is listed as a PPPL Collaborator Report on the PPPL Web Site). PPPL provides an electronic copy of the paper to Columbia University so that it could be posted on the Columbia web site.

Example 2: DIII-D Scientist "Y" has conducted experiments on NSTX, DIII-D, and C-Mod. She writes a paper, which encompasses data from all three devices, and acknowledges each project in the publication. She provides copies to NSTX, DIII-D and C-Mod for review. Each of the projects/institutions provides comments within a two-week period. She resolves the comments with her co-authors and submits the paper for publication utilizing the GA procedures and forms. GA issues a report and provides electronic copies to PPPL and MIT for use on their web site.

Thoughts on the Relationship of PEAs, Milestones and Plain English Goals

We receive several requests for information regarding the plans and deliverables for the major facilities. The information is needed by various elements in the government (Office of Science, Secretary of DOE, OSTP, OMB and Congress among others) in the formulation of the budget, by the community in developing an understanding of our plans (IPPA process), and by auditors which review our compliance with contractual requirements as well as with GPRA. In recent years, there has been a request for communicating our plans in "plain English", which is meant to address the needs of the Office of Science, Secretary of DOE, OSTP, OMB and Congress among others. This information is submitted as part of the FWP. Sometimes these are not sufficiently detailed that they can be used for PEAs, which are a contractual commitment. I do not know whether the PEAs address the needs of GPRA but my understanding is that they are intended to. The IPPA Level 3 Test Template requests among other things: Statement of Work, Scientific/Technical Approach, Statement of Deliverables, and Milestones. There is a discussion of how the overall task is related to the FESAC Goals/Objectives (Sec. 26) but not how each milestone is related. The Statement of Work and Scientific/Technical Approach is part of the present FWP package.

Facility related milestones such as the installation of diagnostic or neutral beam are in general more straightforward. Thus, I will address a suggested approach for scientific milestones:

For each milestone, there is a one-sentence heading written in plain English describing the milestone. In the IPPA Level 3 Template, the Statement of Deliverables will be a listing of these headings.

In the milestone section of the IPPA Level 3 Template and in the PEAs, for each milestone the following is provided:
Start with the one sentence heading written in plain English.
Short paragraph written in plain English describing the goal and why it is scientifically interesting and advances the goals of the Program.
If need be, a short paragraph written for members of the Office clarifying or describing what would be done. For example, the range of heating power or densities, which would be explored, the use of new diagnostic of RF capability, or the run time allocated would be described. This would address the contractual requirements, if needed. From our previous discussion it is clear that some milestones correspond to sufficiently general research that they would be extended from one year to another. This would provide a mechanism for both showing progress as well and demonstrating that the contractual requirements were fulfilled.
A discussion of how the milestone relates to the FESAC Goals and Objectives in the IPPA Level 2 document. This information can be rolled up in the answer to Sec. 26 but I think it would be better to do this for each milestone.

As a practical matter, the submissions at the FWP are modified in the fall when the budgets are released and the PEAs are written. For the purposes of this discussion the FWP is a draft version of the input to the IPPA process and the PEAs are the final version, which take into account the budget. I think this approach addresses the requests for information I am aware of.